

## CLAIMS

What is claimed is:

1. A disc brake pad backplate assembly comprising:
  - a backplate including circumferentially spaced abutments separated by a distance;
  - a pad spring including end portions and a central portion between the end portions, wherein the circumferentially spaced abutments of the backplate restrain lateral movement of the end portions of the pad spring; and
  - a retaining feature to mount the pad spring to the backplate, wherein at least one of the backplate and the pad spring includes the retaining feature,
    - wherein the pad spring is dimensioned relative to the distance between the circumferentially spaced abutments such that a radially inward loading applied at the central portion of the pad spring causes the pad spring to function in a first resilient leaf spring-like mode where the end portions of the pad spring are unrestrained up to a predetermined load limit, and wherein above the predetermined load limit the end portions of the pad spring are restrained by the circumferentially spaced abutments of the backplate and the pad spring functions in a second buckling mode, and
    - wherein a spring rate of the pad spring in the first mode is lower than the spring rate of the pad spring in the second mode.
2. The backplate assembly according to claim 1 wherein the pad spring further includes radially outwardly curved ends.
3. The backplate assembly according to claim 2 wherein the backplate further includes complementary curved abutment surfaces.
4. The backplate assembly according to claim 1 wherein the retaining feature is lugs.
5. The backplate assembly according to claim 4 wherein the backplate includes the lugs, and the lugs extend radially outwardly from the backplate.

6. The backplate assembly according to claim 4 wherein the backplate includes the lugs and the pad spring further includes complementary apertures that receive the lugs.
7. The backplate assembly according to claim 6 wherein the lugs are the circumferentially spaced abutments.
8. The backplate assembly according to claim 1 wherein the pad spring has a curved profile.
9. The backplate according to claim 8 further including a pad strap, wherein the pad spring is retained by the pad strap.

10. A disc brake comprising:
  - a backplate assembly including a backplate including circumferentially spaced abutments separated by a distance;
  - a pad spring including end portions and a central portion between the end portions, wherein the circumferentially spaced abutments of the backplate restrain lateral movement of the end portions of the pad spring; and
  - a retaining feature to mount the pad spring to the backplate, wherein at least one of the backplate and the pad spring includes the retaining feature,
  - wherein the pad spring is dimensioned relative to the distance between the circumferentially spaced abutments such that a radially inward loading applied at the central portion of the pad spring causes the pad spring to function in a first resilient leaf spring-like mode where the end portions of the pad spring are unrestrained up to a predetermined load limit, and wherein above the predetermined load limit the end portions of the pad spring are restrained by the circumferentially spaced abutments of the backplate and the pad spring functions in a second buckling mode, and
  - wherein a spring rate of the pad spring in the first mode is lower than the spring rate of the pad spring in the second mode.

11. A vehicle comprising;

a disc brake including a backplate assembly including a backplate including circumferentially spaced abutments separated by a distance;

a pad spring including end portions and a central portion between the end portions, wherein the circumferentially spaced abutments of the backplate restrain lateral movement of the end portions of the pad spring; and

a retaining feature to mount the pad spring to the backplate, wherein at least one of the backplate and the pad spring includes the retaining feature,

wherein the pad spring is dimensioned relative to the distance between the circumferentially spaced abutments such that a radially inward loading applied at the central portion of the pad spring causes the pad spring to function in a first resilient leaf spring-like mode where the end portions of the pad spring are unrestrained up to a predetermined load limit, and wherein above the predetermined load limit the end portions of the pad spring are restrained by the circumferentially spaced abutments of the backplate and the pad spring functions in a second buckling mode, and

wherein a spring rate of the pad spring in the first mode is lower than the spring rate of the pad spring in the second mode.